CBSE Class 10 Mathematics · Sample Paper 1 (2026-27 pattern)

Time: 3 hours · Maximum marks: 80 · CBSE Math Revision (not an official CBSE paper)

General instructions

1. This question paper contains 38 questions. All questions are compulsory.
2. The paper is divided into five sections: A, B, C, D and E.
3. Section A: questions 1–18 are MCQs and questions 19–20 are Assertion–Reason based, 1 mark each.
4. Section B: questions 21–25 are very short answer (VSA) questions of 2 marks each.
5. Section C: questions 26–31 are short answer (SA) questions of 3 marks each.
6. Section D: questions 32–35 are long answer (LA) questions of 5 marks each.
7. Section E: questions 36–38 are case study based questions of 4 marks each, with sub-parts of 1, 1 and 2 marks.
8. There is no overall choice. Internal choice is provided in 2 questions of Section B, 2 of Section C, 2 of Section D and in the 2-mark sub-part of each case study in Section E.
9. Draw neat figures wherever required. Take $\pi = \dfrac{22}{7}$ wherever required, unless stated otherwise.
10. Use of calculators is not allowed.

Section A

20 marks

Questions 1 to 20 carry 1 mark each. Questions 1 to 18 are multiple choice questions (MCQs); questions 19 and 20 are Assertion–Reason based questions.

1. If $p = 2^4 \times 3 \times 5^2$ and $q = 2^2 \times 3^3 \times 5$, then $\text{HCF}(p, q)$ is **1**

(a) 30 **(b)** 60
(c) 120 **(d)** 180

2. If 3 is a zero of the polynomial $x^2 - kx + 12$, then the value of k is **1**

(a) 5 **(b)** 7
(c) -7 **(d)** 12

3. The pair of equations $3x + 5y = 7$ and $6x + ky = 11$ has no solution when k equals **1**

(a) 5 **(b)** -10
(c) 10 **(d)** $\dfrac{22}{7}$

4. The roots of $2x^2 - 6x + c = 0$ are real and equal. The value of c is **1**

(a) 3 **(b)** $\dfrac{9}{2}$
(c) 9 **(d)** 18

5. The 11th term of the AP $-7, -3, 1, 5, \ldots$ is **1**

(a) 29 **(b)** 33
(c) 37 **(d)** 40

6. The distance between the points $(a, -b)$ and $(-a, b)$ is **1**

(a) $\sqrt{a^2 + b^2}$ **(b)** $2\sqrt{a^2 + b^2}$

(c) $2(a + b)$ **(d)** $4\sqrt{ab}$

7. The mid-point of the segment joining $(a, 4)$ and $(6, b)$ is $(4, 7)$. Then (a, b) is **1**

(a) $(2, 10)$ **(b)** $(10, 2)$

(c) $(2, 3)$ **(d)** $(-2, 10)$

8. In $\triangle PQR$, S and T are points on PQ and PR with $ST \parallel QR$. If $PS = 3$ cm, $SQ = 4.5$ cm and $PT = 2.4$ cm, then TR is **1**

(a) 1.6 cm **(b)** 3.6 cm

(c) 4.8 cm **(d)** 5.4 cm

9. PA and PB are tangents from an external point P to a circle with centre O. If $\angle APB = 64^\circ$, then $\angle OAB$ is **1**

(a) 26° **(b)** 32°

(c) 58° **(d)** 64°

10. If $7 \sin A = 24 \cos A$, where A is acute, then $\sec A - \tan A$ equals **1**

(a) $\dfrac{1}{7}$ **(b)** 7

(c) $\dfrac{25}{7}$ **(d)** $\dfrac{1}{25}$

11. A taut guy-wire 40 m long runs from the top of a vertical telecom mast to a peg on level ground and makes an angle of 30° with the ground. The height of the mast is **1**

(a) $20\sqrt{3}$ m **(b)** $40\sqrt{3}$ m

(c) 20 m **(d)** $\dfrac{40}{\sqrt{3}}$ m

12. The area of a sector of a circle of radius 21 cm with central angle 40° is $\left(\pi = \dfrac{22}{7}\right)$ **1**

(a) 77 cm^2 **(b)** 132 cm^2

(c) 154 cm^2 **(d)** 308 cm^2

13. The length of the arc of a circle of radius 14 cm that subtends an angle of 45° at the centre is $\left(\pi = \dfrac{22}{7}\right)$ **1**

(a) 5.5 cm **(b)** 11 cm

(c) 22 cm **(d)** 44 cm

14. A toy is a cone mounted on a hemisphere of the same radius 3.5 cm. The slant height of the cone is 5 cm. The total surface area of the toy is $\left(\pi = \dfrac{22}{7}\right)$ **1**

(a) 93.5 cm^2 **(b)** 115.5 cm^2

(c) 132 cm^2 **(d)** 154 cm^2

15. For a grouped distribution, the modal class is 40–50, and the frequencies of the modal class, the class before it and the class after it are 16, 10 and 12 respectively. The mode is **1**

(a) 44 **(b)** 45

(c) 46 **(d)** 48

16. For a moderately skewed distribution, the mean is 24 and the median is 26. Using the empirical relation, the mode is **1**

(a) 22 **(b)** 25

(c) 28 **(d)** 30

17. A bag has 5 red, 8 green and 7 blue discs of the same size. One disc is drawn at random. The probability that it is *not* green is **1**

(a) $\frac{2}{5}$ **(b)** $\frac{3}{5}$

(c) $\frac{7}{20}$ **(d)** $\frac{1}{4}$

18. A number is chosen at random from $1, 2, 3, \ldots, 30$. The probability that it is a multiple of both 3 and 4 is **1**

(a) $\frac{1}{15}$ **(b)** $\frac{1}{10}$

(c) $\frac{1}{6}$ **(d)** $\frac{2}{5}$

19. In the following question, a statement of Assertion (A) is followed by a statement of Reason (R). Choose the correct option. **1**

Assertion (A): The graph of $y = x^2 + 4x + 5$ does not meet the x-axis.

Reason (R): A quadratic polynomial $ax^2 + bx + c$ has no real zeroes when $b^2 - 4ac < 0$.

(a) Both Assertion (A) and Reason (R) are true and Reason (R) is the correct explanation of Assertion (A).

(b) Both Assertion (A) and Reason (R) are true but Reason (R) is not the correct explanation of Assertion (A).

(c) Assertion (A) is true but Reason (R) is false.

(d) Assertion (A) is false but Reason (R) is true.

20. In the following question, a statement of Assertion (A) is followed by a statement of Reason (R). Choose the correct option. **1**

Assertion (A): 0 is a term of the AP $31, 28, 25, \ldots$

Reason (R): An AP with a negative common difference eventually has negative terms.

(a) Both Assertion (A) and Reason (R) are true and Reason (R) is the correct explanation of Assertion (A).

(b) Both Assertion (A) and Reason (R) are true but Reason (R) is not the correct explanation of Assertion (A).

(c) Assertion (A) is true but Reason (R) is false.

(d) Assertion (A) is false but Reason (R) is true.

Section B

10 marks

Questions 21 to 25 are very short answer (VSA) type questions carrying 2 marks each. Internal choice is provided in 2 questions.

21. Two numbers are $2^4 \times 3^a \times 5$ and $2^b \times 3^2 \times 7$, where a, b are natural numbers. Their HCF is 36 and their LCM is 5040. Find a and b. **2**

22. Find the zeroes of $10x^2 - 9x - 7$ and verify the relationship between the zeroes and the coefficients. **2**

23. In $\triangle ABC$, D and E are points on AB and AC respectively such that $DE \parallel BC$. If $AD = 4$ cm, $DB = (x - 4)$ cm, $AE = 8$ cm and $EC = (3x - 19)$ cm, find x. **2**

OR

A quadrilateral $PQRS$ is drawn to circumscribe a circle. If $PQ = (x + 3)$ cm, $QR = 2x$ cm, $RS = 13$ cm and $SP = (3x - 4)$ cm, find x and the perimeter of $PQRS$.

24. Evaluate: $4\sin^2 60^\circ + 3\tan^2 30^\circ - 8\sin 45^\circ \cos 45^\circ$. **2**

25. Two fair dice are thrown together. Find the probability that the product of the numbers on the top faces is a perfect square. **2**

OR

Cards numbered $5, 6, 7, \ldots, 54$ are put in a box and one card is drawn at random. Find the probability that the number on the card is (i) a perfect square, (ii) not divisible by 5.

Section C

18 marks

Questions 26 to 31 are short answer (SA) type questions carrying 3 marks each. Internal choice is provided in 2 questions.

26. Prove that $\sqrt{3}$ is irrational. Hence show that $(2 + \sqrt{3})^2$ is irrational. **3**

27. At a school canteen in Lucknow, 3 samosas and 2 plates of idli cost ₹130, while 2 samosas and 5 plates of idli cost ₹215. Find the cost of one samosa and of one plate of idli. **3**

28. In $\triangle ABC$, D is a point on AB and E a point on AC such that $DE \parallel BC$. Through E a line is drawn parallel to AB, meeting BC at F. Prove that $\dfrac{AD}{DB} = \dfrac{BF}{FC}$. Hence, if $AD = 3$ cm, $DB = 5$ cm and $BC = 16$ cm, find FC. **3**

OR

AB is a diameter of a circle with centre O. The tangent at a point C on the circle meets the tangent at B at the point T. Prove that $OT \parallel AC$.

29. A circle is inscribed in $\triangle ABC$, touching BC, CA and AB at D, E and F respectively. If $AB = 13$ cm, $BC = 15$ cm and $CA = 14$ cm, find AF, BD and CE. **3**

30. Prove that $(\sin A + \cos A)(\tan A + \cot A) = \sec A + \operatorname{cosec} A$. **3**

31. A solid wooden toy is a cylinder of radius 3.5 cm and height 6 cm, with a cone of the same radius and height 12 cm fixed on top. Find the total surface area and the volume of the toy. $\left(\pi = \frac{22}{7}\right)$ **3**

OR

A glass panel is in the shape of the minor segment cut off by a chord AB of a circle of radius 21 cm, where AB subtends 120° at the centre. Find the area of the panel. $\left(\pi = \frac{22}{7},\ \sqrt{3} = 1.73\right)$

Section D

20 marks

Questions 32 to 35 are long answer (LA) type questions carrying 5 marks each. Internal choice is provided in 2 questions.

32. An electrical shop in Indore buys a lot of identical LED bulbs for ₹4800. If each bulb had cost ₹40 less, the shop would have got 20 more bulbs for the same amount. Form a quadratic equation and find the number of bulbs bought and the cost of each bulb. **5**

OR

Riya starts a monthly savings plan with ₹2000 in the first month and increases the instalment by ₹250 every month. (a) In which month does her instalment first exceed ₹5000? (b) Find the total amount she pays in the first two years. (c) After how many months will her total payments be ₹45,500?

33. State and prove the Basic Proportionality Theorem. Using it, solve: in $\triangle ABC$, D and E lie on AB and AC with $DE \parallel BC$, $AD : DB = 2 : 3$, $DE = 6$ cm and $AE = 4.8$ cm. Find BC and AC. **5**

OR

Prove that the lengths of the tangents drawn from an external point to a circle are equal. Using this, find the radius of the circle inscribed in a triangle ABC, right-angled at B, with $AB = 8$ cm and $BC = 15$ cm.

34. A survey drone rises vertically from a point D on level ground at a constant speed. An observer stands at O on the same ground, 90 m from D. At one instant the angle of elevation of the drone from O is 30°; 20 seconds later it is 60°. (a) Find the heights of the drone at the two instants. (b) Find the speed of ascent. (c) How many seconds after the first observation was the angle of elevation 45°? (Take $\sqrt{3} = 1.73$.) **5**

35. The daily electricity consumption (in units) of 50 households in a Jaipur colony is given below. **5**

Units	0–10	10–20	20–30	30–40	40–50	50–60
Households	5	6	14	12	8	5

(a) Find the mean consumption using the step-deviation method. (b) Find the median consumption. (c) The colony newsletter claims that 'more than half the households use at most 30 units a day'. Is the claim supported? Justify.

Section E

12 marks

Questions 36 to 38 are case study based questions carrying 4 marks each (1 + 1 + 2). Internal choice is provided in the 2-mark sub-part of each case study.

36. **Daily savings.** Aarav starts a savings jar for a school trip. He puts ₹5 in the jar on day 1, ₹8 on day 2, ₹11 on day 3, and so on, adding ₹3 more each day than the day before. **4**

i. How much does he put in the jar on day 10? *[1 mark]*

ii. On which day does he put ₹71 in the jar? *[1 mark]*

iii. Find the total amount in the jar at the end of 30 days. *[2 marks]*

OR

After how many days will the total in the jar first reach ₹670? *[2 marks]*

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37. **Village planning.** On a map of a village near Nashik drawn on a grid (1 unit = 1 km), the school is at $S(2, 3)$ and the primary health centre is at $H(8, 11)$. A straight road joins S and H. **4**

i. Find the length of the road SH. *[1 mark]*

ii. A bus stop is at the mid-point of SH. Find its coordinates. *[1 mark]*

iii. A water tank T is on the road with $ST : TH = 3 : 2$. Find the coordinates of T. *[2 marks]*

OR

A well is to be dug on the x-axis at equal distances from S and H. Find its coordinates. *[2 marks]*

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38. **Watering the lawn.** A rectangular lawn in a housing society measures 20 m by 15 m. A sprinkler fixed at one corner sprays water up to 14 m and turns through 90°, so it waters a quarter-circle of the lawn. $\left(\pi = \dfrac{22}{7}\right)$ **4**

i. Find the area of the lawn watered by the sprinkler. *[1 mark]*

ii. Find the area of the lawn that is not watered. *[1 mark]*

iii. The curved edge of the watered region is to be lined with bricks at ₹25 per metre, and the watered region is to be re-turfed at ₹40 per m². Find the total cost. *[2 marks]*

OR

Instead, the sprinkler is placed at the mid-point of a 20 m side and turns through 180° with a spray radius of 10 m. Find the area watered and the percentage of the lawn it covers. *[2 marks]*